

Examiner: G. Holliden

Art Unit: 1616

## DECLARATION OF

**RICHARD D. CHAMBERS**

I, Richard D. Chambers, declare as follows:

2. As set forth in my *Curriculum Vitae*, submitted as Exhibit 1, I earned a Bachelor of Science (Honours, Class 1) degree in Chemistry in 1956, a Ph.D. in Chemistry in 1959, and a D.Sc. in 1968, all from the University of Durham, England. I held a Postdoctoral Fellowship at the University of British Columbia, Vancouver, from 1959 to 1960, and was thereafter appointed Lecturer at the University of Durham.

3. I am presently a full Professor of Chemistry at Durham, and was Chairman and Head of the Department of Chemistry from 1983 to 1986. Since 1995, I also have been a Nonexecutive Director of F2 Chemicals, Ltd., a British company specializing in fluorochemicals. I received the American Chemical Society Award for Creative Work in Fluorine Chemistry in 1981. In 1997, I was elected a Fellow of the Royal Society (The United Kingdom Academy of Sciences). I authored the specialist treatise "Fluorine in Organic Chemistry" published by Wiley-Interscience, New York. In addition, I have co-authored numerous peer reviewed published papers related to organofluorine chemistry.

merous peer-reviewed  
RECEIVED  
FEB 04 2003  
TECH CENTER 1600/2900

4. I have reviewed the Schneider applications U.S.S.N. 07/695,343 and 07/775,989 and EP Application Nos. 92810046.0, 90810262.7, 90810367.4 and PCT/EP91/00620 ("Schneider's earlier-filed applications"). Each of Schneider's earlier filed applications discloses a "physiologically acceptable gas being selected from the group consisting of SF<sub>6</sub>, . . . CF<sub>4</sub>, CBrF<sub>3</sub>, C<sub>4</sub>F<sub>8</sub>, CClF<sub>3</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>2</sub>ClF<sub>5</sub>, CBrClF<sub>2</sub>, C<sub>2</sub>Cl<sub>2</sub>F<sub>4</sub>, CBr<sub>2</sub>F<sub>2</sub> and C<sub>4</sub>F<sub>10</sub>" in the specifications generally, through the disclosure of the use of "physiologically acceptable gases" (e.g., U.S.S.N. 07/695,343, p. 10; EP 90810367.4, p. 10; U.S.S.N. 07/775,989, pp. 1, 15; PCT/EP91/00620, pp. 1, 15; EP 90810262.7, pp. 1, 14), and specifically, through the disclosure of the use of "freon" for its microbubble contrast agents (e.g., U.S.S.N. 07/695,343, p. 10; EP 90810367.4, p. 10; U.S.S.N. 07/775,989, pp. 9, 15; PCT/EP91/00620, pp. 9, 15; EP 90810262.7, pp. 8, 14; EP 92810046.0, p. 17).

5. The term "freon" generally refers to a well-known, well-documented family of fluorinated carbon-containing compounds which includes a "physiologically acceptable gas comprising an organic compound containing one or more carbon atoms and fluorine. Chlorine, bromine and hydrogen atoms may also be present." E.I. DuPont DeNemours and Company, "Freon" Fluorocarbons: Properties And Applications, Freon Product Information, 1987 p. 2. Furthermore, the principal properties of freon include "non-flammability, low toxicity, excellent thermal and chemical stability, high density coupled with low boiling point, low viscosity, and low surface tension." E.I. DuPont DeNemours and Company, "Freon" Fluorocarbons: Properties And Applications, Freon Production Information, 1987, p. 2. Given these disclosures in the specification, as well as the well recognized characteristics and properties of freon, it is clear that freon includes CF<sub>4</sub>, CBrF<sub>3</sub>, C<sub>4</sub>F<sub>8</sub>, CClF<sub>3</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>2</sub>ClF<sub>5</sub>, CBrClF<sub>2</sub>, C<sub>2</sub>Cl<sub>2</sub>F<sub>4</sub>, CBr<sub>2</sub>F<sub>2</sub> and C<sub>4</sub>F<sub>10</sub>.

6. It is well established that C<sub>4</sub>F<sub>10</sub> is a freon. Both CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> (i.e., CF<sub>3</sub>-CF<sub>3</sub>) are advertised as freon products. E.g., E.I. DuPont DeNemours and Company, "Freon"

Fluorocarbons: Properties And Applications, Freon Product Information, 1987, p. 2. The presence of both  $\text{CF}_4$  and  $\text{C}_2\text{F}_6$  as freons in a brochure advertising specific freon products for sale supports that other saturated perfluorinated carbon-containing gases such as  $\text{C}_4\text{F}_{10}$  should also be freons. E.I. DuPont DeNemours and Company, "Freon" Fluorocarbons: Properties And Applications, Freon Product Information, 1987, p. 2. The mere absence of a compound from a brochure which advertises some specific freon products for sale does not preclude unadvertised compounds such as  $\text{C}_4\text{F}_{10}$  which meet the proper characteristics and properties from being recognized as freons.

7. Furthermore, it is well established that  $\text{CBrClF}_2$  and  $\text{CBr}_2\text{F}_2$  are freons. As an initial matter,  $\text{CF}_4$ ,  $\text{CBrF}_3$  and  $\text{CClF}_3$  are advertised as freon products. E.I. DuPont DeNemours and Company, "Freon" Fluorocarbons: Properties And Applications, Freon Product Information, 1987, p. 2. The presence of gases such  $\text{CF}_4$ ,  $\text{CBrF}_3$  and  $\text{CClF}_3$  as freons in a brochure advertising specific freon products for sale supports that gases wherein one or more bromine or chlorine atoms are substituted for fluorine in a saturated perfluorinated carbon-containing gas are also freons. Thus, since  $\text{CBrClF}_2$  and  $\text{CBr}_2\text{F}_2$  each substitute one or more bromine or chlorine atoms for fluorine in the saturated perfluorinated carbon-containing freon gas  $\text{CF}_4$ , they too should be considered freons. E.I. DuPont DeNemours and Company, "Freon" Fluorocarbons: Properties And Applications, Freon Product Information, 1987, p. 2. The mere absence of a compound from a brochure which advertises some specific freon products for sale does not preclude unadvertised compounds such as  $\text{C}_4\text{F}_{10}$ ,  $\text{CBrClF}_2$  and  $\text{CBr}_2\text{F}_2$  which meet the proper characteristics and properties from being recognized as freons.

8. Additionally, even if some gases such as  $\text{SF}_6$  are not freons, Schneider's earlier filed applications still support the disclosure of  $\text{SF}_6$  because it recites "physiologically acceptable gases like . . . freon" and  $\text{SF}_6$  is a fluorine-containing gas with substantially similar properties to

freon. EP 90810262.7, p. 14; PCT/EP91/00620, p. 15; and EP 9081367.4, p. 10. On another note, SF<sub>6</sub> is specifically supported in EP 92810046.0, p. 12.

All statements made of my own knowledge are true and all statements made on information and belief are believed to be true. I make this declaration understanding that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of the patent application or any patent issuing thereon.

Respectfully submitted,

Richard D. Chambers  
Richard D. Chambers, Ph.D.

Dated: 22 March, 2000.

## PROFESSOR RICHARD DICKINSON CHAMBERS

**Born:** Stanley, County Durham, England, March 16th 1935.

### **Education:**

Stanley Grammar School,	1946-1953
University of Durham,	1953-1956
	B.Sc.(Hons) Chemistry Class 1
	1956-1959
	Ph.D. (supervisor: Professor W.K.R. Musgrave)

### **Career:**

University of British Columbia, Vancouver,	1959-1960 Post-doctoral research fellowship with Professor H.C. Clark
University of Durham	1960- Appointed Lecturer
Case-Western Reserve University, Cleveland, Ohio	1966-1967 Sabbatical Leave. Fulbright Scholar and Visiting Lecturer. Research collaboration with Professor G.A. Olah .
University of Durham	1968 Awarded D.Sc.
	1969 Appointed Reader in Chemistry
Book Publication of 'Fluorine in Organic Chemistry', Wiley-Interscience, N.Y.	1973
University of Durham	1976 Appointed Professor of Chemistry
	1983-1986 Chairman and Head of the Dept. of Chemistry
	1988-89 Sir Derman Christopherson Research Fellow
Award	1991

American Chemical Society Award  
for Creative Work in Fluorine  
Chemistry

Visiting Professor	1995 University of Paris
Directorship	1995 Appointed Non-Executive Director of F2Chemicals Ltd.
Fellow of the Royal Society	1997 Elected.
Tarrant visiting Professor	1999 University of Florida, Inaugural recipient.

Professor Chambers has published many papers in academic journals as well as books, and papers on the subject of organic compounds containing fluorine.

List of Publications - Professor R.D. Chambers

(University of Durham, U.K.)

1959

1. The Oxidation of Aromatic Hydrocarbons and Phenols by Trifluoroperoxyacetic Acid  
R.D. Chambers, P. Goggin, and W.K.R. Musgrave  
J. Chem. Soc., 1959, 1804.

1960

2. The Reaction of Hexamethyl-Ditin with Trifluoro-iodomethane  
R.D. Chambers, H.C. Clark and C.J. Willis  
Chem. and Ind., 1960, 76.
3. The Trifluoromethylfluoroborate Anion  
R.D. Chambers, H.C. Clark, and C.J. Willis  
Proc. Chem. Soc., 1960, 114.
4. Some Salts of Trifluoromethylfluoroboric Acid  
R.D. Chambers, H.C. Clark, and C.J. Willis  
J. Amer. Chem. Soc., 1960, 82, 5298.

1961

5. The Addition of 'Halogen Monofluorides' to Fluoro olefins  
R.D. Chambers, W.K.R. Musgrave, and J. Savory  
Proc. Chem. Soc., 1961, 113.
6. Mixtures of Halogens and Halogen Polyfluorides as Effective Sources of the Halogen Monofluorides in Reactions with Fluoro-olefins  
R.D. Chambers, W.K.R. Musgrave, and J. Savory  
J. Chem. Soc., 1961, 3779.
7. Perfluoroalkyl Derivatives of Tin II. Dimethyltrifluoromethyltin chloride  
R.D. Chambers, H.C. Clark, and C.J. Willis  
Canad. J. Chem., 1961, 39, 131.
8. The Fluorine Magnetic Resonance in the Ions  $[BF_4]^-$  and  $[CF_3BF_3]$   
R.D. Chambers, H.C. Clark, L.W. Reeves, and C.J. Willis  
Canad. J. Chem., 1961, 39, 258.
9. The Semi-Micro Determination of Fluorine and Chlorine in Organic Compounds  
R.D. Chambers, W.K.R. Musgrave, and J. Savory  
J. Analyt. Chem., 1961, 86, 356.

1962

10. Organometallic and Metalloid Compounds Made from Heptafluoro-2-iodopropane, and their Properties  
R.D. Chambers, W.K.R. Musgrave, and J. Sato  
J. Chem. Soc., 1962, 1993.
11. The Preparation and Study of Some Pentafluorophenyl-mercury Compounds  
R.D. Chambers, G.E. Coates, J.G. Livingstone, and W.K.R. Musgrave  
J. Chem. Soc., 1962, 1367

1963

12. Model Compounds Related to Viton A  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
Tetrahedron Lett., 1963, 619.
13. Cleavage Reactions of Pentafluorophenyl Derivatives of Tin and Boron  
R.D. Chambers and T. Chivers  
Proc. Chem. Soc., 1963, 208.
14. Direct Preparation of Some Functional Fluoroaromatic Compounds  
G.M. Brooke, R.D. Chambers, J. Heyes, and W.K.R. Musgrave  
Tetrahedron, 1963, 94
15. Hexafluoro- and Perchlorofluoro-Benzenes from Perchlorodifluorocyclohexanes and -Cyclohexenes  
R.D. Chambers, J. Heyes, and W.K.R. Musgrave  
Tetrahedron, 1963, 19, 891.
16. Orientation Reactions of Chloropentafluorobenzene and Related Compounds  
G.M. Brooke, R.D. Chambers, J. Heyes, and W.K.R. Musgrave  
Proc. Chem. Soc., 1963, 213.

1964

17. Direct Preparation and Some Reactions of Chlorofluorobenzenes  
G.M. Brooke, R.D. Chambers, J. Heyes, and W.K.R. Musgrave  
J. Chem. Soc., 1964, 729.
18. Pentafluoro- and Chlorofluoro-Pyridines  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
Proc. Chem. Soc., 1964, 83.
19. Polyfluoro-heterocyclic Compounds. Part I. The Preparation of Fluoro-, Chlorofluoro-, and Chlorofluorohydro-pyridines  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave



- J. Chem. Soc., 1964, 3573.
20. Polyfluoro-heterocyclic Compounds. Part 2. Nucleophilic Substitution in Pentafluoropyridine  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
J. Chem. Soc., 3736.
  21. Polyfluoro-heterocyclic Compounds. Part 3. Hydroxy-derivatives of Pentafluoro- and Chlorofluoro-pyridines  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
J. Chem. Soc., 1964, 5634.
  22. Telomerisation Reactions in the Synthesis of Models for Some Fluorocarbon Polymers  
R.D. Chambers, J. Hutchinson, R.H. Mobbs, and W.K.R. Musgrave  
Tetrahedron, 1964, 20, 497.
  23. Polyfluoroaryl Organometallic Compounds. Part 1. Pentafluorophenyl Derivatives of Tin  
R.D. Chambers and T. Chivers  
J. Chem. Soc., 1964, 4782.
  24. Details of the Preparation of the Biphenyl-Sodium-Dimethoxyethane Complex  
R.D. Chambers, T.F. Holmes, and W.K.R. Musgrave  
The Analyst, 1964, 89, 369.
- 1965
25. 'Ionic Reactions of Fluoro-olefins', R.D. Chambers and R.H. Mobbs, Advances in Fluorine Chemistry, Vol. 4, Ed. Stacey, Tallow, and Sharpe, Butterworths, London, 1965, pp. 50-112.
  26. Polyfluoroheterocyclic Compounds. Part 4. Compounds Derived from 4-Aminotetrafluoropyridine  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
J. Chem. Soc., 1965, 5040.
- 1966
27. Part 5. Catalytic Reduction of Perfluoro- and Chlorofluoro-pyridines and the Preparation of Polyfluoropyridine Carboxylic Acids  
R.D. Chambers, F.G. Drakesmith, and W.K.R. Musgrave  
J. Chem. Soc., 1965, 5045.
  28. Diels-Alder Adducts of a Perfluorodiene and a Synthesis of Tetrafluoronaphthalene  
R.D. Chambers, W.K.R. Musgrave, and D.A. Pyke  
Chem. and Ind., 1965, 564.
  29. Polyfluoroaryl Organometallic Compounds. Part 2. Pentafluorophenylboron Halides and Some Derived Compounds  
R.D. Chambers and T. Chivers  
J. Chem. Soc., 1965, 3933.

30. Polyfluoroaryl Organometallic Compounds. Part 3. Potassium Pentafluorophenyltrifluoroborate  
R.D. Chambers, T. Chivers, and D.A. Pike  
J. Chem. Soc., 1965, 5144.
31. Pentafluorophenyl Derivatives of Trivalent Aluminium  
R.D. Chambers and J.A. Cunningham  
Sci. Letters, 1965, 2389.
32. Polyfluoroheterocyclic Compounds. Part 6. Nucleophilic Substitution in Tetrafluoro-1-methylpyrimidine  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1966, 229.
33. Polyfluoroheterocyclic Compounds. Part 7. Heptafluoroquinoline and -isoquinoline  
R.D. Chambers, M. Hole, B. Iddon, W.K.R. Musgrave, and R.A. Storey  
J. Chem. Soc. (C), 1966, 2328.
34. Polyfluoroheterocyclic Compounds. Part 8. Nucleophilic Substitution in Heptafluoro-quinoline and -isoquinoline  
R.D. Chambers, M. Hole, W.K.R. Musgrave, R.A. Storey, and (in part) B. Iddon  
J. Chem. Soc. (C), 1966, 2331.
35. Preparation of Nucleophilic Substitution in Perfluoropyridazine (Perfluoro-1,2-diazine)  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. and Ind., 1966, 904.
36. Preparation and Nucleophilic Substitution of Perfluoropyrazine and a New Synthesis of Perfluoropyrimidine  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. and Ind., 1966, 1721.
37. Polyfluoroalkylation. The Nucleophilic Equivalent of Friedel-Crafts Reactions  
R.D. Chambers, R.A. Storey, and W.K.R. Musgrave  
Chem. Comms., 1966, 384.
38. Pentafluorophenyl-Metal Compounds  
R.D. Chambers and T. Chivers  
Organometallic Chem. Revs., 1966, 1, 279.

#### 1967

39. Polyfluoroheterocyclic Compounds. Part 9. Tautomerism in Polyfluorohydroxy-quinolines and -isoquinolines  
R.D. Chambers, M. Hole, W.K.R. Musgrave, and R.A. Storey  
J. Chem. Soc. (C), 1967, 53.
40. An SO Elimination leading to Octafluorodibenzofuran  
R.D. Chambers and J.A. Cunningham  
Chem. Comms., 1967, 583.

11. Bis-(tetrafluoropyridyl)mercurials and an Attempted Generation of Trifluoropyridine  
R.D. Chambers, F.G. Drakesmith, Hutchinson and W.K.R. Musgrave  
Nat. Letters, 1967, 1705
12. Polyfluoroaryl Organometallic Compounds. Part 1. Fluorocarbon Derivatives of Trivalent Aluminium  
R.D. Chambers and J.A. Cunningham  
J. Chem. Soc. (C), 1967, 2185
13. Polyfluoroaryl Organometallic Compounds. Part 5. An Olefin-Insertion Reaction into Fluorocarbon-Aluminium Compounds and a  $\sigma$ -Bonded Olefin-Aluminium System  
R.D. Chambers and J.A. Cunningham  
Nat. Letters, 1967, 2813
14. Alkyl- and Aryl-alkylfluorocarbenium Ions. The Dimethyl- and Phenylmethyl-fluorocarbenium Ion  
G.A. Olah, R.D. Chambers, and M.B. Comisarow  
J. Amer. Chem. Soc., 1967, 89, 1268

## 1968

45. Polyfluoroheterocyclic Compounds. Part 10. 2,3,5,6-Tetrafluoro-4-methylpyridine and related Compounds  
R.D. Chambers, B. Iddon, W.K.R. Musgrave, and L. Chadwick  
Tetrahedron, 1968, 2, 877.
46. Polyfluoroheterocyclic Compounds. Part 11. Factors Controlling the Orientation of Nucleophilic Substitution in Octafluoro-3,3'-bipyridyl and Related Compounds  
R.D. Chambers, D. Lomas, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1968, 625.
47. Polyfluoroheterocyclic Compounds. Part 12. Preparation and Nucleophilic Substitution of Tetrafluoropyridazine  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1968, 2116.
48. Polyfluoroheterocyclic Compounds. Part 13. Preparation and Nucleophilic Substitution Reactions of Polyfluoro-2,2'-bipyridyls  
R.D. Chambers, D. Lomas, and W.K.R. Musgrave  
Tetrahedron, 1968, 24, 5663.
49. Polyfluoroheterocyclic Compounds. Part 14. Some Reactions of Tetrafluoroisonicotinic Acid and Pentafluoro-benzoic Acid  
R.D. Chambers, C.A. Heaton, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1968, 1933.

50. Polyfluoroheterocyclic Compounds Part 15 Formation and Nucleophilic Substitution of Polyfluoropyridazinium Cations  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1968, 2989.
51. Preparation and Nucleophilic Substitution of Hexafluoroquinoxaline  
C.G. Allison, R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. and Ind., 1968, 1402.
52. Reactions Involving Fluoride Ion. Part 1 The Polyfluoroalkylation of Fluorinated Aromatic Systems  
R.D. Chambers, J.A. Jackson, W.K.R. Musgrave, and R.A. Storey  
J. Chem. Soc. (C), 1968, 2221.
53. Polyfluoroaryl Organometallic Compounds. Part 6 Some Reactions of Pentafluorophenyl- and Orthobromotetrafluoro-phenyl-Organometallic Compounds  
R.D. Chambers, J.A. Cunningham, and D.A. Pyke  
Tetrahedron, 1968, 24, 2783.
54. Polyfluoroaryl Organometallic Compounds. Part 7 Synthesis and Nucleophilic Substitution in Octafluorodibenzo-thiophen and in Octafluorothianthren  
R.D. Chambers, J.A. Cunningham, and D.J. Spring  
Tetrahedron, 1968, 24, 3997.
55. Polyfluoroaryl Organometallic Compounds Part 8 Synthesis of and Nucleophilic Substitution in Octafluorodibenzo-furan  
R.D. Chambers, J.A. Cunningham, and D.J. Spring  
J. Chem. Soc. (C), 1968, 1560.
56. Polyfluoroaryl Organometallic Compounds. Part 9. Reactions of Polyfluoroaryllithium with Dimethyl Carbonate Octafluorofluoren-9-one  
R.D. Chambers and D.J. Spring  
J. Chem. Soc. (C), 1968, 2394.

## 1969

57. The Isomerism of Perfluoropyridazines to Perfluoropyrimidines and to Perfluoropyrazines  
C.G. Allison, R.D. Chambers, Yu. A. Cheburkov, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. Comms., 1969, 1200.
58. Rotational Isomers in Polyfluoroaromatic Compounds  
R.D. Chambers, J.A. Jackson, and W.K.R. Musgrave  
Chem. Comms., 1969, 178.
59. Polyfluoroheterocyclic Compounds. Part 16 Tetrafluoropyridine-3-and-4-carbaldehydes and some Derivatives of the latter  
R.D. Chambers, C.A. Heaton, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1969, 1700.

60. A New Aromatic Rearrangement  
R.D. Chambers, R.P. Corbally, J.A. Jackson and W.K.R. Musgrave  
Chem. Comms., 1969, 127.
  61. Preparation of Geometric Isomers of Some Polyfluoro-2-butenes  
R.D. Chambers and A.I. Palmer  
Tetrahedron, 1969, 25, 1917.
  62. Polyfluoroaryl Organometallic Compounds. Part 10. Nucleophilic Substitution in Octafluorofluorene-9-one  
R.D. Chambers and D.J. Spring, Tetrahedron, 1969, 25, 565.
  63. Polyfluoroaryl Organometallic Compounds. Part 11. An Unusual Benzyne Reaction  
R.D. Chambers and D.J. Spring  
Tetrahedron Letts., 1969, 2481.
- 1970
64. Polyfluoroheterocyclic Compounds. Part 17. Preparation and Nucleophilic Substitution of Tetrafluoropyrazine and the Orientational Effect of Substituents in Polysubstitution  
C.G. Allison, R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1970, 1023.
  65. Preparation and Nucleophilic Substitution of Hexafluoroquinazoline  
C.G. Allison, R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave, Tetrahedron Letts., 1970, 1979.
  66. Preparation and Nucleophilic Substitution of Hexafluorophthalazine  
Tetrahedron Letts., 1970, 57.
  67. Hexafluorocinnoline: Synthesis and Photochemical Isomerisation to Hexafluoro-quinazoline  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. Comms., 1970, 739.
  68. The Fluoride Ion-catalysed Rearrangement of 3,6-Difluoro-4,5-bis(hexafluoroisopropyl)pyridazine  
R.D. Chambers, Yu. A. Cheburkov, J.A.H. MacBride, and W.K.R. Musgrave  
Chem. Comms., 1970, 1647.
  69. F-F Coupling Constants in Some Perfluoroalkyl Fluoroaromatic Compounds. The Signs of Through-Space Coupling Constants  
R.D. Chambers, L.H. Sutcliffe, and G.J.T. Tiddy  
Trans. Farad. Soc., 1970, 66, 1025.
  70. Reactions Involving Fluoride Ion. Part 2. Fluorine Magnetic Resonance Studies of Polyfluoroalkyl Aromatic Compounds  
R.D. Chambers, J.A. Jackson, and W.K.R. Musgrave  
Tetrahedron, 1970, 26, 71.
  71. Fluoride-ion-initiated Reactions of Acetylenes  
R.D. Chambers, W.K.R. Musgrave, and S. Partington

Chem. Comms., 1970, 1050.

72. Hexafluoroacelone-Hydrogen Peroxide: A New Peroxyacid  
R.D. Chambers and M. Clark  
Tetrahedron Lett., 1970, 2711.

1971

73. Polyfluoroheterocyclic Compounds. Part 18. Reactions of Heptafluoroquinoline and -isoquinoline and Pentafluoropyridine with Hydrogen Halides  
R.D. Chambers, M. Hole, W.K.R. Musgrave, and J.G. Thorpe  
J. Chem. Soc., 1971, 61.
74. Polyfluoroheterocyclic Compounds. Part 19. Relative Base Strengths of Some Polyfluoroaryl-Nitrogen Heterocyclic Systems  
S.L. Bell, R.D. Chambers, W.K.R. Musgrave, and J.G. Thorpe  
J. Fluorine Chem., 1971-72, 1, 51.
75. Polyfluoroheterocyclic Compounds. Part 20. Preparation and Nucleophilic Substitution of Hexafluoroquinoxaline  
C.G. Allison, R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
J. Fluorine Chem., 1971-72, 1, 59.
76. Polyfluoroheterocyclic Compounds. Part 21. Thermal Rearrangement of Perfluoropyridazine and Perfluoroalkylpyridazines to Pyrimidines  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
J. Chem. Soc. (C), 1971, 3384.
77. A *para*-Bonded Isomer of an Aromatic Diazine  
R.D. Chambers, W.K.R. Musgrave, and K.C. Srivastava  
Chem. Comms., 1971, 264.
78. Kinetic *versus* Thermodynamic Control of Products in some Nucleophilic Aromatic Substitution Reactions  
R.D. Chambers, R.P. Corbally, M.Y. Gribble, and W.K.R. Musgrave  
Chem. Comms., 1971, 1345.
79. Reactions Involving Fluoride Ion. Part 3. Preparation, Rearrangement, and Hydrolysis of Perfluoroisopropyl-pyridazines  
R.D. Chambers, Yu. A. Cheburkov, J.A.H. MacBride, and W.K.R. Musgrave  
J. Chem. Soc., 1971, 532.
80. Polyfluoroaryl Organometallic Compounds. Part 12. Nucleophilic Substitution in Octafluorodibenzothiophene and Related Compounds  
R.D. Chambers and D.J. Spring  
Tetrahedron, 1971, 27, 669.

81. Polyfluoroaryl Organometallic Compounds Part 13. Pentachlorophenylpentafluorophenylmercury  
R.D. Chambers and D.J. Spring  
J. Organometallic Chem. 1971, 21, C13.

82. Polyfluoroaryl Organometallic Compounds Part 14. 5-PhenylOctafluorodibenzophosphole  
R.D. Chambers and D.J. Spring  
J. Fluorine Chem. 1971, 72, 1, 309.

#### 1972

83. Experimental and Theoretical Studies of the Molecular Core Binding Energies of Some Six-Membered Ring Nitrogen Heterocycles and their Perchloro- and Perfluoro-Derivatives  
D.T. Clark, R.D. Chambers, D. Kilcast, and W.K.R. Musgrave  
J.C.S. Farad. Trans. II. 1972, 68, 309.

84. Polyfluoroaryl Organometallic Compounds Part 15. Synthesis and Rearrangement of Polyhalogenoaryl  $\alpha$ -Diketones  
R.D. Chambers, M. Clark, and D.J. Spring  
J.C.S. Perkin I. 1972, 2464.

85. Polyfluoroaryl Organometallic Compounds Part 16. Reactions of Organolithium Compounds with Halogenated Benzils  
R.D. Chambers and M. Clark  
J.C.S. Perkin I. 1972, 2469.

86. Reactions Involving Fluoride Ion. Part 4. Synthesis and Rearrangement of Perfluoroisopropylpyridines  
R.D. Chambers, R.P. Corbally, and W.K.R. Musgrave  
J.C.S. Perkin I. 1972, 1281.

87. Reactions Involving Fluoride Ion. Part 5. Synthesis of Perfluoroisopropylquinolines  
R.D. Chambers, R.P. Corbally, W.K.R. Musgrave, J.A. Jackson, and R.S. Matthews  
J.C.S. Perkin I. 1972, 1286.

#### 1973

88. Reactions Involving Fluoride Ion. Part 6. Reactions of Tetrafluoroethylene with Pentafluoropyridine and Tetrafluoropyridazine  
R.D. Chambers and M.Y. Gribble  
J.C.S. Perkin I. 1973, 1405.

89. Reactions Involving Fluoride Ion. Part 7. Reactions of Polyfluoroethylenes with Pentafluoropyridine and Tetrafluoropyridazine  
R.D. Chambers and M.Y. Gribble  
J. Chem. Soc. 1973, 1411.

90. Reactions Involving Fluoride Ion. Part 8. Syntheses from Perfluorocycloalkenes  
R.D. Chambers, M. Gribble, and E. Harper

JCS Perkin I, 1973, 1710.

91. Reactions Involving Fluoride Ion. Part 9. Syntheses Involving Octafluoroisobutene  
S.L. Beil, R.D. Chambers, M.Y. Gribble, and J.R. Maslakiewicz  
JCS Perkin I, 1973, 1716

92. Fluorine in Organic Chemistry  
R.D. Chambers, Wiley-Interscience, New York, 1973

93. Pyridazine Rearrangements  
R.D. Chambers, M. Clark, J.R. Maslakiewicz, and W.K.R. Musgrave  
Tetrahedron Lett., 1973, 2105.

94. A Fluorinated Long-Lived Allyl Cation  
R.D. Chambers, R.S. Matthews, and A. Perkin  
Chem. Comm., 1973, 509.

# 1974

95. Reactions Involving Fluoride Ion. Part 10. E.S.C.A. Investigation of the Electronic Structure of Polyhexafluoro-but-2-yne  
R.D. Chambers, D.T. Clark, D. Kilcast, and S. Partington  
J. Polymer Science, Polymer Chem. Ed., 1974, 12, 1647.
96. Reactions Involving Fluoride Ion. Part 11. Syntheses from Hexafluorobut-2-yne  
R.D. Chambers, S. Partington, and D.B. Speight  
JCS Perkin I, 1974, 2673.
97. Reactions Involving Fluoride Ion. Part 22. Preparation of and Nucleophilic Substitution in Perfluoro-3,5-dimethylpyridine and Perfluoro-3-methylpyridine  
R.D. Chambers, R.P. Corbally, T.F. Holmes, and W.K.R. Musgrave  
JCS Perkin I, 1974, 108.
98. Polyfluoroheterocyclic Compounds. Part 23. Monoenes and Dienes Derived by the Fluorination of Hexafluorobenzene and of Perfluoro- and Chlorofluoroheteroaromatic Compounds. A Mechanism for Fluorination by Cobalt Fluorides  
R.D. Chambers, D.T. Clark, T.F. Holmes, W.K.R. Musgrave, and I. Ritchie  
JCS Perkin I, 1974, 114.
99. Polyfluoroheterocyclic Compounds. Part 24. Thermal Elimination of Molecular Nitrogen from Polyfluoro- and Polychloro-pyridazines  
R.D. Chambers, M. Clark, J.A.H. MacBride, W.K.R. Musgrave, and K.C. Srivastava  
JCS Perkin I, 1974, 125.
100. Polyfluoroheterocyclic Compounds. Part 25. Thermal Reaction of Perfluoroalkylpyridazines  
R.D. Chambers, M. Clark, J.R. Maslakiewicz, W.K.R. Musgrave, and P.G. Urban  
JCS Perkin I, 1974, 1513.



101. Polyhalogenoheterocyclic Compounds. Part 26. Nucleophilic Substitution in Trifluoropyrazines  
R.D. Chambers, W.K.R. Musgrave, and P.G. Urban  
JCS Perkin I, 1974, 2580.
  102. Polyhalogenoheterocyclic Compounds. Part 27. Nucleophilic Substitution in Chlorofluoropyrazines and Tetrachloropyrazine  
R.D. Chambers, W.K.R. Musgrave, and P.G. Urban  
JCS Perkin I, 1974, 2584.
  103. Evidence Against Negative Hyperconjugation Involving Perfluoroalkyl Groups  
R.D. Chambers, J.S. Waterhouse, and D.L.H. Williams  
Tetrahedron Letts., 1974, 743.
  104. Orientation and Reactivity in Nucleophilic Replacement in Polyfluorobenzenes and -pyridines  
R.D. Chambers, W.K.R. Musgrave, J.S. Waterhouse, and D.L.H. Williams; and I. Burdon, W.B. Hollyhead, and J.C. Fallow  
Chem. Comms., 1974, 239.
- 1975
105. Pyridinium Salts of Halogenated Heterocyclic Compounds  
R.D. Chambers, W.K.R. Musgrave, and P.G. Urban  
Chem. and Ind., 1975, 89.
  106. Chlorination of Perfluorodiazines  
R.D. Chambers, W.K.R. Musgrave, and P.G. Urban  
J. Fluorine Chem., 1975, 5, 275.
  107. Transpositions in Aromatic Rings  
R.D. Chambers, R. Middleton, and R.P. Corbally  
Chem. Comms., 1975, 731.
  108. Reactions Involving Fluoride Ion. Part 12. Reactions of Polyfluoroaromatic Compounds with Octafluorobut-2-ene  
R.D. Chambers, J.A. Jackson, P.D. Philpot, and A.C. Young  
J. Fluorine Chem., 1975, 6, 5.
  109. Photochemistry of Halocarbon Compounds. Part 1. Rearrangement of Pyridazines to Pyrazines  
R.D. Chambers, J.A.H. MacBride, J.R. Maslakiewicz and K.C. Srivastava  
JCS Perkin I, 1975, 396.
  110. Photochemistry of Halocarbon Compounds. Part 2. Valence Isomers from Fluorinated Pyridazines  
R.D. Chambers, J.R. Maslakiewicz, and K.C. Srivastava  
JCS Perkin I, 1975, 1130.

---

Title of the series modified

111. Transpositions in Aromatic Rings  
R.D. Chambers, R. Middleton, and R.P. Connolly  
Chem. Comm., 1975, 731.
- 1976**
112. Polyhalogenoheterocyclic Compounds. Part 18. Polychloromandoles  
G.M. Brooke, R.D. Chambers, W.K.R. Musgrave, R.A. Storey, and J. Yeaton  
JCS Perkin I, 1976, 162.
113. Polyhalogenoheterocyclic Compounds. Part 19. Perchloro-acridinephenanthrenes and -benzo[h]quinoline  
R.D. Chambers, R. Daniels, W.K.R. Musgrave, and P.L. Russell  
JCS Perkin I, 1976, 1069.
114. Possible Generation of a Fluorinated Azacyclobutadiene  
R.D. Chambers and J.R. Maslakiewicz  
Chem. Comm., 1976, 1005.
115. Perfluoroallyl Cations  
R.D. Chambers, A. Parkin, and R.S. Matthews  
JCS Perkin I, 1976, 2107.
- 1977**
116. Mechanisms for Reactions of Halogenated Compounds. Part 1. Activating Effect of Fluorine in Polyfluoropyridines in Reactions with Ammonia  
R.D. Chambers, J.S. Waterhouse, and D.L.H. Williams  
JCS Perkin II, 1977, 585.
117. Mechanisms for Reactions of Halogenated Compounds. Part 2. Orientating Effects of Chlorine Substituents in Nucleophilic Aromatic Substitution  
R.D. Chambers, D. Close, W.K.R. Musgrave, J.S. Waterhouse, and D.L.H. Williams  
JCS Perkin II, 1977, 1774.
118. Stable 2-Azabicyclo[2.2.0]hexa-2,5-diene Derivatives  
R.D. Chambers and R. Middleton  
Chem. Comm., 1977, 154.
119. Photochemistry of Halocarbon Compounds. Part 3. Rearrangements Involving Azaprismanes  
R.D. Chambers and R. Middleton  
JCS Perkin I, 1977, 1500.
120. Reactions Involving Fluoride Ion. Part 13. Reactions of Perfluoro-4-vinylpyridine  
R.D. Chambers, J. Hutchinson, and P.D. Philpot  
J. Fluorine Chem., 1977, 215.

121. • Reactions Involving Fluoride Ion Part 14 Anionic  $\sigma$ -Complexes from Polyfluorinated *S*-Triazines  
R.D. Chambers, P.D. Philpot, and P.L. Russell  
J. Chem. Soc. Perkin I, 1977, 1605.

## 1978

122. Perfluoro-aza and -diazacyclohexadiene Derivatives  
R.D. Chambers, R.D. Hercliffe, and W.A.R. Musgrave  
Chem. Comm., 1978, 304.
123. Reactions Involving Fluoride Ion. Part 15 Oligomers from Chlorotrifluoroethylene  
R.D. Chambers, A.A. Lindley, P.D. Philpot, H.C. Fielding, and J. Hutchinson  
Israel J. Chem., 1978, 17, 150.
124. Perfluorinated Derivatives of Furan Via Novel Cyclisation Reactions of Perfluoro-olefins  
R.D. Chambers, A.A. Lindley, P.D. Philpot, H.C. Fielding, J. Hutchinson, and G. Whittaker  
Chem. Comm., 1978, 431.
125. Synthesis of Fluorinated Dienes and Cyclobutenes  
R.D. Chambers, A.A. Lindley, H.C. Fielding, J.S. Moilliet, and G. Whittaker  
Chem. Comm., 1978, 475.
126. Novel Derivatives of Perfluorocyclobutene  
R.D. Chambers, G. Taylor, and R.L. Powell  
Chem. Comm., 1978, 433.
127. Relative Reactivities of Perfluoroalkenes  
R.D. Chambers, A.A. Lindley, and H.C. Fielding  
J. Fluorine Chem., 1978, 12, 85.
128. Free Radical Chemistry. Part I. Stereochemistry of Free Radical Additions of Methanol and Acetaldehyde to Perfluorinated Cycloalkenes  
R.D. Chambers, N. Kelly, J.W. Emsley, and W.G.M. Jones  
J. Fluorine Chem., 1978, 12, 49.
129. Photochemical Conversions of Some Fluorinated Aza- and Diazacyclohexadienes  
R.D. Chambers, R.D. Hercliffe, and R. Middleton  
Chem. Comm., 1978, 305.
130. Photochemical Transformations of Perfluoro-tri- and -tetra-methylfurans  
R.D. Chambers, A.A. Lindley, and H.C. Fielding  
J. Fluorine Chem., 1978, 12, 337.

## 1979

131. Halo Compounds: R.D. Chambers and S.R. James. Chapter 3 in 'Comprehensive Organic Chemistry', Vol. I, Pergamon, Oxford, 1979, pp. 493-566.

132. Thermal Rearrangements of Fluorinated Pyridazines: Mechanism  
R.D. Chambers, C.R. Sargent, and M. Clark  
Chem. Comm., 1979, 445.
133. Sensitisation of Thermal Aromatic Rearrangements  
R.D. Chambers and C.R. Sargent,  
Chem. Comm., 1979, 446.
134. Polyhalogenated Radical-anions  
R.D. Chambers, C.R. Sargent, and F.G. Drakesmith  
Tetrahedron Letts., 1979, 1917.
135. Polyhalogenoheterocyclic Compounds. Part 30. Elimination of Molecular Nitrogen from Trichloro- and Perfluorotriisopropyl-1,2,4-triazine  
R.D. Chambers, W.K.R. Musgrave, and D.E. Wood  
JCS Perkin I, 1979, 1978.
136. Reactions Involving Fluoride Ion. Part 16. Nucleophilic Attack on a Perfluorotetra-alkylethyene and a Synthesis of Perfluorotetramethylfuran  
R.D. Chambers, A.A. Lindley, P.D. Philpot, H.C. Fielding, J. Hutchinson, and G. Whittaker  
JCS Perkin I, 1979, 214.
137. Fluoride Ion-Induced Skeletal Rearrangement  
R.D. Chambers, G. Taylor, and R.L. Powell  
Chem. Comm., 1979, 1062.
- 1980
138. Polyhalogenoheterocyclic Compounds. Part 31. Carbon-13 N.M.R. Spectra as a Structural Probe for Polychloroaromatic Compounds  
R.D. Chambers, R.S. Matthews, W.K.R. Musgrave, and P.G. Urban  
Org. Magnet. Res., 1980, 13, 363.
139. Polyhalogenoheterocyclic Compounds. Part 32. Radical Anions From Halopyridines  
R.D. Chambers, W.K.R. Musgrave, C.R. Sargent, and F.G. Drakesmith  
Tetrahedron, 1980, 37, 591.
140. Polyfluorinated Radical Cations  
R.D. Chambers, C.R. Sargent, M. Silvester, and F.G. Drakesmith  
J. Fluorine Chem., 1980, 15, 257.
141. An Unusual Oxidation  
R.D. Chambers, G. Taylor, and R.L. Powell  
J. Fluorine Chem., 1980, 15, 75.
142. Reactions Involving Fluoride Ion. Part 17. Oligomers of Perfluorocyclobutene  
R.D. Chambers, G. Taylor, and R.L. Powell  
JCS Perkin I, 1980, 426.

113. Reactions Involving Fluoride Ion. Part 18. Derivatives of Perfluorocycloalkenes  
R.D. Chambers, G. Taylor, and R.L. Powell  
J.C.S. Perkin I, 1980, 129.
114. Reactions Involving Fluoride Ion. Part 19. Observable Perfluorocycloalkyl anions  
R.D. Chambers, R.S. Matthews, and G. Taylor  
J.C.S. Perkin I, 1980, 135.
115. Reactions Involving Fluoride Ion. Part 20. Competition Between Isomerisation and Nucleophilic Attack on a Perfluoroalkene  
S. Bartlett, R.D. Chambers, A.A. Lindley, and H.C. Fielding  
J.C.S. Perkin I, 1980, 1551.
116. Reactions Involving Fluoride Ion. Part 21. Nucleophilic Substitution Reactions of Perfluorocyclobutene Oligomers  
R.D. Chambers, G. Taylor, and R.L. Powell  
J. Fluorine Chem., 1980, 16, 161.
117. Free-Radical Chemistry. Part 2. Additions of Dimethylether to F-cycloalkenes  
R.D. Chambers, N. Kelly, W.K.R. Musgrave, and R.W. Rendell  
J. Fluorine Chem., 1980, 16, 351.
118. Mechanisms for Reactions of Halogenated Compounds. Part 3. Variation in Activating Influence of Halogen Substituents in Nucleophilic Aromatic Substitution  
R.D. Chambers, D. Close, and D.L.H. Williams  
J.C.S. Perkin II, 1980, 778.
149. A Novel Furan Synthesis  
S. Bartlett, R.D. Chambers, and N.M. Kelly  
Tetrahedron Letts., 1980, 21, 1891.
- 1981
150. 'Polyfluoroheteroaromatic Compounds'  
R.D. Chambers and C.R. Sargent  
Advances in Heterocyclic Chem., Academic Press, 1981, vol. 28, 1-71.
151. Polyhalogenoheterocyclic Compounds. Part 33. Mechanism of Thermal Rearrangements of Perfluoropyridazine and Perfluoroalkylpyridazines  
R.D. Chambers, W.K.R. Musgrave, and C.R. Sargent  
J.C.S. Perkin I, 1981, 1071.
152. Polyhalogenoheterocyclic Compounds. Part 34. Synthesis of Perfluoroaza- and -diazacyclohexadiene Derivatives by Fluorination of Perfluoro-azines and -diazines  
R.N. Barnes, R.D. Chambers, R.D. Hercliffe, and W.K.R. Musgrave  
J.C.S. Perkin I, 1981, 2059.
153. Reactions Involving Fluoride Ion. Part 22. Dimerisation of Perfluoro-2,3-dimethylbutadiene and Related Reactions

- M.R. Bryce, R.D. Chambers, and G. Taylor  
JCS Chem Comm. 1983, 76
164. Polyhalogenoheterocyclic Compounds. Part 15. Reactions of Fluorinated Alkenes and Cycloalkenes with Enolate Anions  
R.D. Chambers, J.R. Kirk, and R.L. Powell  
JCS Perkin I 1983, 1239
165. Reactions Involving Fluoride Ion. Part 17. Reactions of Perfluoro-3,4-dimethylhex-3-ene with Carbon Nucleophiles  
S. Bartlett, R.D. Chambers, J.R. Kirk, A.A. Lindley, H.C. Fielding, and R.L. Powell  
JCS Perkin I 1983, 1235.
166. Reactions Involving Fluoride Ion. Part 29. Reactions of Perfluoro-2,3-dimethylbuta-1,3-diene  
M.R. Bryce, R.D. Chambers, A.A. Lindley, and H.C. Fielding  
JCS Perkin I 1983, 2451.
167. Perfluorobicyclobutylidene. Unusual Reactivity Arising from Angle Strain  
R.D. Chambers, J.R. Kirk, G. Taylor, and R.L. Powell  
J Fluorine Chem. 1983, 22, 393.
168. Photochemically Induced 1,3-Fluorine Shifts. The Synthesis of Novel Spiro Compounds  
M.R. Bryce, R.D. Chambers, and G. Taylor  
JCS Chem Comm. 1983, 1457.
- 1984
169. Reactions Involving Fluoride Ion. Part 28. Cyclisation and Formation of Dimers from Perfluoro-2,5-diazahexa-2,4-diene  
R.N. Barnes, R.D. Chambers, M.J. Silvester, and C.D. Hewitt  
J Fluorine Chem. 1984, 24, 211.
170. Reactions Involving Fluoride Ion. Part 30. Preparation and Reactions of Epoxides Derived from Perfluoroalkyl Substituted Alkenes  
M.R. Bryce, R.D. Chambers, and J.R. Kirk  
JCS Perkin I 1984, 1391.
171. Polyhalogenoheterocyclic Compounds. Part 36. Additions of Diazomethane to Perfluoropolyalkylethenes. A Frontier Orbital Rationalisation of Reactions of Fluorinated Alkenes with 1,3-Dipoles and Nucleophiles  
M.R. Bryce, R.D. Chambers, and G. Taylor  
JCS Perkin I 1984, 509.
172. Stereochemistry of Nucleophilic Additions to Hexafluoro-2-butyne  
R.D. Chambers, C.G.P. Jones, M.J. Silvester, and D.B. Speight  
J Fluorine Chem. 1984, 25, 47.
173. A New Route to Perfluorinated Ethers  
R.D. Chambers, and B. Grievson

BEST AVAILABLE COPY

J. Fluorine Chem. 1984, 25, 523.

KL3:260889.1

174. Electrophilic Fluorination of Aryl Tin and Aryl Mercury Derivatives  
M.R. Bryce, R.D. Chambers, and S.T. Mulins  
J. Fluorine Chem. 1984, 26, 533.
  
- 1985
  
175. Reactions Involving Fluoride Ion. Part 31. Co-Oligomers of  
Perfluoro-1-methyl-1,3-diazacyclopent-2-ene  
R.N. Barnes, R.D. Chambers, C.D. Hewitt, M.J. Silvester, and E. Klouke  
JCS Perkin I 1985, 53.
  
176. Direct Observation of Simple Fluorinated Carbanions  
A.E. Bayliff, M.R. Bryce, R.D. Chambers, and R.S. Matthews  
JCS Chem. Comm. 1985, 1018.
  
177. Reactions Involving Fluoride Ion. Part 32. Remarkable Reactivity of Perfluorobicyclobutylidene  
A.E. Bayliff, M.R. Bryce, R.D. Chambers, J.R. Kirk, and G. Taylor  
JCS Perkin I 1985, 1191.
  
178. Free-Radical Chemistry. Part 3. Substituent Effects in Additions of Ethers to Fluorinated Alkenes  
R.D. Chambers, B. Grievson, and N. Kelly  
JCS Perkin I 1985, 2209.
  
179. Free-Radical Chemistry. Part 4. Stereoelectronic Effects in the Additions of Cyclic Ethers to  
Fluorinated Alkenes  
R.D. Chambers and B. Grievson  
JCS Perkin I 1985, 2215.
  
180. Free-Radical Chemistry. Part 5. A New Approach to the Synthesis of Fluorinated Ethers  
R.D. Chambers and B. Grievson  
J. Fluorine Chem. 1985, 29, 323.
  
181. Free-Radical Chemistry. Part 6. Halogenation of Perfluoro-Ethers and -Borate Esters  
R.D. Chambers and B. Grievson.  
J. Fluorine Chem. 1985, 30, 227.
  
182. A New Approach to Di(perfluoroaryl)methanes Utilising Sulphone-Stabilised Carbanions  
R.D. Chambers and M. Todd  
J. Fluorine Chem. 1985, 27, 237.
  
- 1986
  
183. Polyhalogenoheterocyclic Compounds. Part 37. Perfluorotetrahydro-Quinoline, Isoquinoline, and  
Related Compounds  
S.L. Bell, R.D. Chambers, R. Daniels, T.F. Holmes, and M.J. Silvester  
J. Fluorine Chem. 1986, 32, 403.
  
184. Reactions Involving Fluoride Ion. Part 33. Perfluoroaza-alkylation of Fluorinated Heteroaromatics



with Perfluoro-1-methyl-1,3-diazocyclopent-2- and -3-ene  
 R.D. Chambers, C.D. Hewitt, and M.J. Silvester  
J. Fluorine Chem., 1986, **22**, 389

185. Electrophilic Fluorination of Arylalkylidene Derivatives with Caesium Fluoroxysulphate  
 R.D. Chambers, M.R. Bryce, S.T. Mullins, and A. Parkin  
JCS Chem. Commun., 1986, 1623
186. Electrophilic Fluorination of Tin and Mercury Derivatives as a Route to Fluoroaromatics  
 R.D. Chambers, M.R. Bryce, S.T. Mullins, and A. Parkin  
Bull. Soc. Chim. France, 1986, 930.
187. Reactions Involving Fluoride Ion. Part 34. A Novel Ring Contraction  
 R.D. Chambers, R.N. Barnes, and C.D. Hewitt  
Fluorine Chem., 1986, **34**, 59
188. Free-Radical Chemistry. Part 7. Additions to Hexafluoro-2-butyne  
 R.D. Chambers, C.G.P. Jones, and M.J. Silvester  
J. Fluorine Chem., 1986, **32**, 309
- 1987
189. Polyhalogenoheterocyclic Compounds. Part 38. Reactions of Fluorinated-Alkenes and-Cycloalkenes with Difunctional Nucleophiles. A.E. Bayliff, M.R. Bryce, and R.D. Chambers. JCS Perkin I, 1987, 763.
190. Chemistry of Model Compounds  
 R.D. Chambers, M.J. Salisbury, C.G. Apsey, and A. Fontana  
J. Fluorine Chem., 1987, **35**, 46.
191. Electrophilic Fluorinations  
 R.D. Chambers, S.T. Mullins, M.R. Bryce, and A. Parkin  
J. Fluorine Chem., 1987, **35**, 64.
192. Observable Fluorocarbanions  
 R.D. Chambers, A.E. Bayliff, M.R. Bryce, and G. Taylor  
J. Fluorine Chem., 1987, **35**, 65.
193. Free-Radical Additions of Amides and Amines to F-Alkenes  
 R.D. Chambers, A.P. Swales, B. Grievson, and S.L. Jones  
J. Fluorine Chem., 1987, **35**, 66.
194. Polyfluoroarylorganometallic Compounds. Part 17. 2,4,6-Tris(trifluoro-methyl)phenyllithium  
 R.D. Chambers, G.E. Carr, T.F. Holmes, and D.G. Parker  
J. Organometallic Chem., 1987, **325**, 13

195. Azetes from Fluorinated 1,2,3-Triazines  
R.D. Chambers, M. Tamura, T. Shepherd, and C.J. Ludman  
J. Chem. Soc. Chem. Commun. 1987, 1699
196. Perfluoroalkyl-1,2,3-Triazines - Novel Nucleophilic Attack on Ring Nitrogen  
R.D. Chambers, and M. Tamura  
J. Chem. Soc. Chem. Commun. 1987, 1697
- 1988
197. 'Fluorinated Carbanions'  
R.D. Chambers and M.R. Bryce  
Chapter in 'Comprehensive Carbanion Chemistry' Vol. 3, Elsevier, 1988
198. Mechanisms for Reactions of Halogenated Compounds. Part 5. Orientating Effects of Fluorine Substituents on Nucleophilic Substitution in Naphthalene and Other Polycyclic Systems  
R.D. Chambers, M.J. Seabury, and D.L.H. Williams  
J. Chem. Soc. Perkin I. 1988, 251.
199. Mechanisms for Reactions of Halogenated Compounds. Part 6. Investigations into the Activating Effect of *Ortho*-Fluorine in Nucleophilic Aromatic Substitution  
R.D. Chambers, M.J. Seabury, and D.L.H. Williams  
J. Chem. Soc. Perkin I. 1988, 255.
200. Sodium Perfluoroalkane Carboxylates as Sources of Perfluoroalkyl Groups  
R.D. Chambers, G.E. Carr, and T.F. Holmes  
J. Chem. Soc. Perkin I. 1988, 921.
201. Reactions Involving Fluoride Ion. Part 34. Stable Perfluorinated Carbanions  
R.D. Chambers and A.E. Bayliff  
J. Chem. Soc. Perkin I. 1988, 201.
202. Electropolymerisation of Perfluorocyclo-alkenes  
M.W. Briscoe, R.D. Chambers, M.J. Silvester, and F.G. Drakesmith  
Tetrahedron Letts. 1988, 29, 1295.
203. Antimony Pentafluoride in the Synthesis of Novel Fluoro-alkene Derivatives and a Novel Approach to Conjugated Polymers  
R.D. Chambers, M. Salisbury, G. Apsey, T.F. Holmes, and S. Modena  
Chem. Comm. 1988, 679.
204. Remarkably Stable Fluorinated Conjugated Cations and a Di-Cation  
R.D. Chambers, M. Salisbury, G. Apsey, and G. Moggi  
Chem. Comm. 1988, 680.
205. Polyhalogenoheterocyclic Compounds. Part 39. Synthesis of Trifluoro-1,2,3-triazene and Perfluoroisopropyl Derivatives  
R.D. Chambers, T. Shepherd, and M. Tamura  
Tetrahedron 1988, 44, 2583.

206. Polymer Chemistry Part 1: Model Compounds Related to Hexafluoropropene-Vinylidene Fluoride Elastomer  
G.C. Apsey, R.D. Chambers, M.L. Salisbury, and G. Moggi  
J. Fluorine Chem. 1988, **40**, 261
207. Synthesis of a Difluoromethylenephosphonate Analogue of Glycerol-3-phosphate: A Substrate for NADH Linked Glycerol-3-phosphate Dehydrogenase  
R.D. Chambers, R. Jaouhari, and D. O'Hagan  
J. Chem. Soc. Chem. Comm. 1988, 1169
208. Studies in the Protection and Selective Deprotection of 5-Amino-1-D-Ribofuranosylimidazole-1-carboxamide (AICA-Riboside)  
R.D. Chambers, M.R. Bryce, S.J. Mullins, and A. Parkin  
Nucleosides and Nucleotides 1988, **7**, 239

## 1989

209. Fluorine in Enzyme Chemistry Part 1: Synthesis of Difluoromethylenephosphonate Derivatives as Phosphate Mimics  
R.D. Chambers, R. Jaouhari, and D. O'Hagan  
J. Fluorine Chem. 1989, **44**, 275.
210. Fluorine in Enzyme Chemistry Part 2: The Preparation of Difluoromethylenephosphonate Analogues of Glycolytic Phosphates: Approaching an Isosteric and Isoelectronic Phosphate Mimic  
R.D. Chambers, R. Jaouhari, and D. O'Hagan  
J. Fluorine Chem. 1989, **45**, 5101.
211. Reactions of Elemental Fluorine with Bromofluoroalkanes  
R.D. Chambers and Z. Chvatal  
J. Fluorine Chem. 1989, **45**, 97.
212. Stable Fluorinated Aryl- and Cyclopentadienyl-Anions  
R.D. Chambers, M.P. Greenhall, S.J. Mullins, and F.G. Drakesmith  
J. Fluorine Chem. 1989, **45**, 111.
213. Novel Synthesis and Regiospecific Cycloaddition Reactions of Perfluoro-3-methylbut-1-yne  
R.D. Chambers, T. Shepherd, M. Tamura, and M.R. Bryce  
J. Chem. Soc. Chem. Comm. 1989, 1657.

## 1990

214. Photochemistry of Halocarbon Compounds Part 5: Photolysis of Fluorinated 1,2,3-Triazine Derivatives  
R.D. Chambers, T. Shepherd, and M. Tamura  
J. Chem. Soc. Perkin Trans. I 1990, 975

215. Photochemistry of Halocarbon Compounds. Part 6. Direct Observation of Fluorinated Azetes  
R.D. Chambers, T. Shepherd, M. Tamura, and P. Hoare  
J. Chem. Soc. Perkin Trans. I 1990, 983.
  216. Polyhalogenoheterocyclic Compounds. Part 39. Reactions of  
4,5,6-Tris(perfluoroisopropyl)-1,2,3-triazine Involving Nucleophilic Attack at Heterocyclic Nitrogen  
X-Ray Crystal Structure of a Spiro Triazinium Zwitterion  
M.R. Bryce, R.D. Chambers, T. Shepherd, M. Tamura, C.A.N. Howard, and G. Johnson  
J. Chem. Soc. Perkin Trans. I 1990, 2379.
  217. A Synthesis of Novel Perfluoro-Dienes  
R.D. Chambers, M. Briscoe, S. Mullins, and T. Nakamura  
J. Chem. Soc. Chem. Comm. 1990, 1127.
  218. A Direct Route to Fluorinated-Cyclopentadiene and-Cyclopentadienyl Anions  
R.D. Chambers and M.P. Greenhall  
J. Chem. Soc. Chem. Comm. 1990, 1128.
  219. Free-Radical Chemistry. Part 8. Electrochemical Fluorination of Partly Fluorinated Ethers  
R.D. Chambers, R.W. Fuss, M. Jones, P. Sartori, and R. Hertelmann  
J. Fluorine Chem. 1990, 409.
  220. The Difluoromethylenephosphonate Moiety as a Phosphate Mimic: X-Ray Structure of 2-Amino-  
difluoroethylphosphonic Acid  
R.D. Chambers, D. O'Hagan, R.B. Lamont, and S.C. Jain  
J. Chem. Soc. Chem. Comm. 1990, 1053.
- 1991**
221. Polymer Chemistry. Part 2. Effective Method for Encapsulation of Titanium Dioxide and Other  
Solids by Gamma-ray-induced Polymerisation  
R.D. Chambers, Z. Chvalal, and R. Templeton-Knight  
J. Materials Chemistry 1991, 1, 59.
  222. Perfluorinated Alkenes and Dienes in a Diverse Chemistry  
R.D. Chambers, S.L. Jones, S.J. Mullins, A. Swales, P. Telford, and M.L.H. West, in "Selective  
Fluorination in Organic and Bio-organic Chemistry", ACS Symposium Series 456, p.68.
  223.  $\gamma$ -Ray Induced Fluoropolymeric Encapsulation  
J.P.S. Badyal, R.D. Chambers, Z. Chvalal, and R. Templeton-Knight  
J. Chem. Soc. Faraday Trans. 87 (1991) 991
  224. Reactions Involving Fluoride Ion. Part 35. Fluorinated Derivatives of Benzyl Anions  
R.D. Chambers, M.P. Greenhall, and M.J. Seabury  
J. Chem. Soc. Perkin Trans. I (1991) 2061.

225. The Synthesis of Bis(trifluoromethyl) Aromatic Compounds  
R.D. Chambers, J. Moilliet, and M.H. Rock  
J. Fluorine Chem. 54 (1991) 249
226. Reactions of Perfluoro-bicyclobutenyl and -bicyclopentenyl  
R.D. Chambers and T. Nakamura  
J. Fluorine Chem. 54 (1991) 257
227. Cyclic Compounds from Perfluoro-3,4-dimethylhexa-2,4-diene  
R.D. Chambers, S.J. Mullins, and F.G. Drake-Smith  
J. Fluorine Chem. 54 (1991) 258
228. Some Novel Fluorinated Di-enes  
R.D. Chambers, M. Briscoe, T. Nakamura, and S.J. Mullins  
Proceedings of the First Soviet-British Symposium on Fluorine Chemistry, Novosibirsk, (1991) 35.
229. A New Telogen for Telechelic Oligomers of Chlorotrifluoroethylene  
R.D. Chambers, M.P. Greenhall, A.P. Wright, and G. Caporiccio  
J. Chem. Soc. Chem. Comm. (1991) 1323.
- 1992
230. Aspects of the Coordination Chemistry of the Organochlorophosphorane  $P(CHCl_2)_3Cl$ , and of its Tetrachloroaluminate Salt  $[P(CHCl_2)_3Cl_3][AlCl_4]$   
R.D. Chambers, K.B. Dillon and T.A. Straw  
Eur. J. Solid State Inorg. Chem. 29 (1992) 899.
231. Polymer Chemistry. Part 3. Gamma-ray Induced Encapsulation of Titanium Dioxide Using Fluorinated Alkenes  
J.P.S. Badyal, R.D. Chambers, Z. Chvatal and G. Descelles  
J. Fluorine Chem. 57 (1992) 159.
232. Unusual Fluorinated Alkenes and Dienes, via Fluoride Ion Induced Processes  
R.D. Chambers  
Chapter 16, Synthetic Fluorine Chemistry, Ed. G.A. Olah, R.D. Chambers and G.K. Surya Prakash, John Wiley and Sons, (1992).
233. Metaphosphate Intermediates from Fluoroaromatic Precursors  
R.D. Chambers, K.B. Dillon and T.A. Straw  
J. Fluorine Chem. 56 (1992) 385.
234. Polyhalogenoheterocyclic Compounds. Part 40. Tertiary Aromatic Amines as Carbon Nucleophiles with Activated Perfluorinated Aromatic Compounds  
R.D. Chambers, S.R. Korn, and G. Sandford  
Tetrahedron 48 (1992) 7939-7950.
235. "Synthetic Fluorine Chemistry"  
Eds. G.A. Olah, R.D. Chambers, and G.K.S. Prakash  
Wiley and Sons, New York, (1992) 402 pp.

1993

236. The Peroxide Initiated Telomerization of Chlorotrifluoroethylene with Perfluorochloroalkyl Iodides  
M.P. Amiry, R.D. Chambers, M.P. Greenham, S. Akeduri, S. Boulevar, G. Caporiccio, G.A. Gornowatz,  
and A.P. Wright  
Amer. Chem. Soc. Polymer Preprints, 34, 1 (1993)
237. Structure, Stability and Reactivity of Some 4-, 5- and 6-Coordinate Phosphorus(V) Compounds  
K.B. Dillon, T.A. Straw and R.D. Chambers  
Phosphorus, Sulfur and Silicon, 76 (1992) 83-86
238. Remarkable Orientational Effects in the Displacement of the Fluorine from  
Heptafluoro-isoquinoline and -quinoline towards Sulfur Nucleophiles. Further Reactions with  
Oxygen Nucleophiles.  
G.M. Brooke, R. D. Chambers, C. J. Drury and in part, M. J. Bower  
J. Chem. Soc. Perkin Trans. 1 (1993) 2201
239. Proton Sponge Hydrofluoride as a Soluble Fluoride Ion Source.  
R. D. Chambers, T. F. Holmes, S. R. Korn, G. Sandford  
J. Chem. Soc. Chem. Comm. (1993) 855
240. A Novel Annulation Process Involving Perfluorocycloalkene Derivatives  
R. D. Chambers, S. R. Korn, G. Sandford  
J. Chem. Soc. Chem. Commun. (1993) 856

1994

241. 1,8-Diazabicyclo[5.4.0]undec-7-ene as a Difunctional Nucleophile  
R.D. Chambers, A.J. Roche, A.S. Balsanov and J.A.K. Howard  
J. Chem. Soc. Chem. Commun. 1994, 2055.
242. Model Compounds and Monomers Derived from 1,1-Difluoroethene  
R.D. Chambers, G.C. Apsey, P. Odello, G. Moggi, and W. Navarrini  
"Macromolecular Symposia - Fluorinated Polymers", Vol. 82, May 1994, pp.33-50, Huthig and Wepf  
Verlag, Heidelberg.
243. Reactions Involving Fluoride Ion. Part 36. Aromatic Amines as Carbon Nucleophiles in Reactions  
with Unsaturated Fluorocarbons  
R.D. Chambers, S.R. Korn, and G. Sandford, J. Chem. Soc. Perkin Trans. 1, 1994, 71.
244. Reactions Involving Fluoride Ion. Part 37. 'Proton-Sponge' Hydrofluoride as a Fluoride Ion Donor  
R.D. Chambers, S.R. Korn and G. Sandford, J. Fluorine Chem., 69 (1994) 103-108.
245. Reactions Involving Fluoride Ion. Part 38. New Fluorinated Dienes by Defluorination.  
M.W. Briscoe, R.D. Chambers, S.J. Mullins, T. Nakamura, J.F.S. Vaughan and F.G. Drakesmith, J. Chem.  
Soc. Perkin Trans. 1, 1994, 3115.

216. Reactions Involving Fluoride Ion. Part 29. Reactions of Perfluorinated Dienes with Oxygen and Sulphur Nucleophiles.  
M.W. Briscoe, R.D. Chambers, S.J. Mullins, T. Nakamura and J.F.S. Vaughan. J. Chem. Soc. Perkin Trans. 1, 1994, 3119.
217. Surface Defluorination of PTFE by Sodium Vomers. J. P. S. Badyal, S. Tasker, and R. D. Chambers. J. Phys. Chem. 98 (1994) 12442.
- 1995**
218. A New Telomer for Telechelic Oligomers of Chlorotrifluoroethylene (I).  
R.D. Chambers, M.P. Greenhall, A.P. Wright and G. Caporiccio. J. Fluorine Chem. 73 (1995) 87-94.
219. Synthesis of Fluorinated Telomers. Part 4. Telomerization of Vinylidene Fluoride with Commercially Available  $\alpha,\omega$ -Diiododifluoroalkanes  
A. Manseri, B. Ameduri, B. Boulevin, R.D. Chambers, G. Caporiccio and A.P. Wright. J. Fluorine Chem. 1995, 74, 59.
250. Polymer Chemistry. Part V.  $\gamma$ -Ray induced telomerisation reactions involving 1,1-difluoroethene and hexafluoropropene  
R.D. Chambers, L.D. Proctor and G. Caporiccio  
J. Fluorine Chem. 70 (1995) 241.
251. Electrophilic Fluorination Using Elemental Fluorine.  
R.D. Chambers, C.J. Skinner, J. Thomson and J. Hutchinson. J. Chem. Soc. Chem. Comm. 1995, 17.
252. Elemental Fluorine as an 'Enabler' for Generation of Powerful Electrophiles from other Halogens  
R.D. Chambers, C.J. Skinner, M. Atherton and J.S. Moilliet. J. Chem. Soc. Chem. Comm. 1995, 19.
253. Direct Fluorination of 1,3-Dicarbonyl Compounds  
R.D. Chambers, M.P. Greenhall and J. Hutchinson. J. Chem. Soc. Chem. Comm. 1995, 21.
254. The Conversion of 1,3-Dithiolanes into Gem-Difluoromethylene Compounds by a Combination of Elemental Fluorine and Iodine  
R.D. Chambers, G. Sandford and M. Atherton. J. Chem. Soc. Chem. Comm. 1995, 177.
255. "The Synthesis of Trihalides".  
R.D. Chambers and J. Hutchinson  
Ch. 6, in 'Functional Group Transformations', Eds. C.W. Rees, A.R. Katritzky, O. Meth-Cohn, Pergamon, 1995, 6, 1-32.
256. An Unusual Rearrangement of a Diepoxide  
R.D. Chambers, J.F.S. Vaughan, and S.J. Mullins. J. Chem. Soc. Chem. Comm. 1995, 629.
257. An Intermolecular Migration of Trifluoromethyl Anion  
R.D. Chambers, Yu. A. Cheburkov, T. Tanabe, and J.F.S. Vaughan. J. Fluorine Chem. 74 (1995) 227-228.
258. Fluorinated Di-enes

R.D. Chambers, J.F.S. Vaughan, S.J. Mullins, T. Nakamura, and A. Roche, J. Fluorine Chem., 72 (1995), 231-233.

259. Direct Synthesis of Pentakis(trifluoromethyl)cyclopentadienide Salts and Related Dienes  
R.D. Chambers, J.F.S. Vaughan, S.J. Mullins, and A.J. Roche, J. Chem. Soc. Chem. Comm., 1995, 841.
260. Reactions Involving Fluoride Ion. Part 10. Anions as Initiators of Fluoride Ion Catalyzed Reactions.  
R.D. Chambers, W.K. Gray, and S.R. Korn, Macromolecules, 51 (1995), 10167-10176.

# 1996

261. Elemental Fluorine. Part 1. Synthesis of Fluoroaromatic Compounds.  
R.D. Chambers, C.J. Skinner, J. Hutchinson, and J. Thomson, J. Chem. Soc. Perkin Trans. 1, 1996, 605.
262. Eliminations from 2H-Heptafluorobut-2-ene  
R.D. Chambers, and A.J. Roche, J. Fluorine Chem., 79 (1996) 121-124.
263. Elemental Fluorine. Part 2. Direct Fluorination of 1,2-Dicarbonyl Compounds. R.D. Chambers, M.P. Greenhall, and J. Hutchinson, Tetrahedron, 52(1) (1996) 1-8.
264. Elemental Fluorine. Part 3. The Preparation of Dialkyl Fluoromalonates by Direct Fluorination.  
R.D. Chambers, J. Hutchinson, and J. Thomson, J. Fluorine Chem., 78 (1996) 165-166.
265. Charge-Transfer Salts Containing Cyclic Perfluorinated Anions.  
M.W. Briscoe, R.D. Chambers, W. Clegg, V.C. Gibson, S.J. Mullins, and J.F.S. Vaughan, J. Fluorine Chem., 76 (1996) 1-2.
266. Polyhalogenated Heterocyclic Compound. Part 41. Cycloaddition Reactions Involving Hexafluorobut-2-yne and 1,1,1,2,4,4,4-Heptafluorobut-2-ene.  
R.D. Chambers, A.J. Roche, and M.H. Rock, J. Chem. Soc. Perkin Trans. 1, 1996, 1095-1100.
267. 2H-Heptafluorobut-2-ene as a Synthon for Hexafluorobut-2-yne.  
R.D. Chambers, and A.J. Roche, J. Fluorine Chem., 79 (1996) 139-143.



268. New Fluorination of Organic Compounds using Thermodynamically Unstable Nickel Fluorides  
N. Bartlett, R.D. Chambers, A.J. Roche, R.C.H. Spink, L. Chacon, and J.M. Whalen, J. Chem. Soc. Chem. Comm., 1996, 1049.
269. Elemental Fluorine. Part 4. The Use of Elemental Fluorine for the Halogenation of Aromatics  
R.D. Chambers, C.I. Skinner, M.J. Atherton, and S. Mordhet, J. Chem. Soc. Perkin Trans. 1, 1996, 1659.
270. Elemental Fluorine. Part 5. Reactions of 1,3-Dithiolanes and Thiophosides with Fluorine in the  
Mixtures.  
R.D. Chambers, G. Sandford, M.E. Sparrowhawk, M.J. Atherton, J. Chem. Soc. Perkin Trans. 1, 1996,  
1941.
271. Perfluorocarbons as Novel Reaction Media for Photooxidation Reactions  
R.D. Chambers, G. Sandford, and A. Shah, Synthetic Comm., 26(10) (1996) 1861-1866.
272. Fluoro-alkene Forming Eliminations using Antimony Pentafluoride.  
G.A. Apsey, R.D. Chambers, and P. Odeilo, J. Fluorine Chem., 77 (1996) 127-132.
273. Unexpected Telomerization of Hexafluoropropene with Dissymmetrical Halogenated Telechelic  
Telogens  
A. Manseri, B. Ameduri, B. Boulevin, R.D. Chambers, G. Caporiccio, and A.P. Wright, J. Fluorine  
Chem., 78 (1996) 145-150.
274. Direct Syntheses of Pentakis(trifluoromethyl) cyclopentadienide Salts and Related Systems.  
R.D. Chambers, A.J. Roche and J.F.S. Vaughan, Canadian J. Chem., 74 (1996) 1925-1929.
275. Syntheses of Perfluorinated Epoxides, Diepoxides, and a Novel Rearrangement.  
R.D. Chambers, J.F.S. Vaughan and S.J. Mullins, Res. Chem. Intermed., 22(8) (1996) 703-715.
276. Elemental Fluorine. Part 6. Fluorination of cyclic-1,3-diketones and Related Compounds.  
R.D. Chambers, J. Hutchinson, A.S. Batsanov, C.W. Lehmann, and D.Y. Naumov, J. Chem. Soc. Perkin  
Trans. 1, 1996, 2271.

# BEST AVAILABLE COPY

-but-2-yne.

R.D. Chambers, S. Nishimura and G. Sandford J. Fluorine Chem. 1998, 63-68.

290 Elemental Fluorine. Part 9. Catalysis of the Direct Fluorination of 2-Substituted Carbonyl Compounds.

R.D. Chambers and J. Hutchinson. J. Fluorine Chem. 92 (1998) 45-52.

## Patents

- 1 Fluoropyridines and their Derivatives  
R.D. Chambers, J. Hutchinson, and W.K.R. Musgrave  
Belg. Pat. 660.873 (1965).
2. Perfluoroheterocyclic Compounds  
R.D. Chambers, J.A.H. McBride, and W.K.R. Musgrave  
B. Pat. 1.163582 (1969).
3. Novel Fluorinated Heterocyclic Compounds  
R.D. Chambers and J.A. Cunningham  
B.P. 1.180.743 (1970).
4. Heptachloroindole, an Intermediate in the Preparation of Indigo and Azo Dyes  
R.D. Chambers, R.A. Storey, and W.K.R. Musgrave  
B.P. 1.177.628 (1970).
5. Herbicidal, Fungicidal, and Insecticidal 5-amino-3,4,6-trifluoro-Pyridazine Derivatives  
R.D. Chambers, J.A.H. MacBride, and W.K.R. Musgrave  
B.P. 1.351.032 (1974).
6. Pyrazines. C.G. Allison  
R.D. Chambers, J.A.H. McBride, and W.K.R. Musgrave  
B. Pat. 1342598 (1974).
7. Preparation of F-2-Butyne  
R.D. Chambers and G. Taylor  
B. Pat. 7908967 (1979).
8. Fluorinated Ethers  
R.D. Chambers, B. Grievson, F.G. Drakesmith, and R.L. Powell  
U.K. Pat. 2.133.794B (1986).
9. Polyether Compounds and their Preparation  
R.D. Chambers  
Eur. Pat. Appln. 87304751.8 (1987); U.S. Pat. 4.877.905 (1989).
10. Halofluorination of Alkenes Using a Combination of Halogens and Elemental Fluorine  
R.D. Chambers and G. Sandford  
1994. Patent Applied For

# BEST AVAILABLE COPY

11. Selective Fluorination of Organic Compounds via Fluorodesulfurization Reactions Using Elemental Fluorine  
R.D. Chambers and G. Sandford  
1994. Patent Applied For
12. Halogenation of Aromatic Compounds Promoted by Elemental Fluorine  
R.D. Chambers and C. Skinner  
1994. Patent Applied For
13. Direct Nitrofluorination of Aromatic Compounds  
R.D. Chambers and C. Skinner  
1994. Patent Applied For
14. Oxidation of Alcohols, Diols, and Polyols by Elemental Fluorine  
R.D. Chambers and G. Sandford  
1994. Patent Applied For
15. A New Process for Functionalisation of Heterocyclic Compounds Promoted by Elemental Fluorine  
R.D. Chambers and C. Skinner  
1994. Patent Applied For
16. A Direct Fluorination Process Using Acid Solvents  
R.D. Chambers, C.J. Skinner, J. Hutchinson, and J. Thomson  
1994. Patent Applied For
17. Preparation of 2-Fluoro and 2,2-Difluoro-1,3-Diketones  
R.D. Chambers, J. Hutchinson, and M.P. Greenhall  
1994. Patent Applied For
18. Fluorination of Hydrazones and Related Derivatives by Elemental Fluorine  
R.D. Chambers and G. Sandford  
1994. Patent Applied For
19. Process for Preparing Polyether Compounds  
R.D. Chambers and A.K. Joel  
1997. U.S. Patent 5,672,767.
20. Halogenation Reactions  
R.D. Chambers, C.J. Skinner, M.J. Atherton and J.S. Moilliet  
1998. U.S. Patent, 5,734,073
21. Selectively Fluorinated Organic Compounds  
R.D. Chambers and G. Sandford  
1998. U.S. Patent, 5,789,580.

## 1997

277. Reactions Involving Fluoride Ion. Part 11. Synthesis of Hexakis(trifluoromethyl) cyclopentadiene and Derived Cyclopentadienide Salts.  
R.D. Chambers, W.K. Gray, J.F.S. Vaughan, S.R. Korn, M. Medebielle, A.S. Balsanov, C.W. Lehmann, and J.A.K. Howard. J Chem Soc Perkin Trans 1 1997. 135.
278. Reactions Involving Fluoride Ion. Part 12. Heterocyclic Compounds from Perfluoro-3,4-dimethylhexa-2,4-diene  
R.D. Chambers, W.K. Gray, S.J. Mullins and S.R. Korn. J Chem Soc Perkin Trans 1 1997. 1157.
279. The Fascination of Fluorine.  
R.D. Chambers. *La Chimica e l'Industria* 1997. 325.
280. Nucleophilic Reactions of Fluorinated Alkenes. R.D. Chambers and J.F.S. Vaughan. p.1-39. in *Organofluorine Chemistry - Fluorinated Alkenes and Reactive Intermediates*. Ed: R.D. Chambers. Springer. 1977.
281. *Organofluorine Chemistry - Techniques and Synthons*. Ed. R.D. Chambers. Springer. 1977 - Volumes 1 and 2.
282. Perfluorocarbon Fluids as Solvent Replacements.  
R.D. Chambers and A.R. Edwards. J Chem Soc Perkin Trans 1 1997. 3623.
283. Elemental Fluorine. Part 7. New Oxidation Methodology.  
R.D. Chambers, J. Hutchinson, G. Sandford, A. Shah and J.F.S. Vaughan. Tetrahedron 53. 46 (1997) 15833-15842.

## 1998

284. Elemental Fluorine. Part 8. Preparation of  $\alpha$ -fluoroketones.  
R.D. Chambers and J. Hutchinson. J Fluorine Chem. 89. 1998. 229-232.
285. Polyhalogenated Heterocyclic Compounds. Part 42. Fluorinated Nitrogen Heterocycles with Unusual Substitution Patterns.  
R.D. Chambers, C.W. Hall, J. Hutchinson and R.W. Millar. 1997. J Chem Soc Perkin Trans 1 1998. 1705.
286. Ambident Nucleophilic Addition to Ethyl Trifluoromethylacetoacetate.  
R.D. Chambers, A.R. Edwards, A.S. Balsanov and J.A.K. Howard. J Fluorine Chem. 88. 1998. 95-97.
287. Cycloadditions and Nucleophilic Attack on *Z*-2,4-Heptafluorobut-2-ene.  
R.D. Chambers and A.R. Edwards. Tetrahedron 54. 1998. 4949.
288. Alkylation and Decarboxylation of Ethyl 2-fluoro-3-oxobutanoate as a Route to Functionalised  $\alpha$ -Fluoro-ketones.  
J. Hutchinson, G. Sandford and J.F.S. Vaughan. Tetrahedron 54. 1998. 2867.
289. Reactions Involving Fluoride Ion. Part 43. Oligomerisations of hexafluoro-1,3-butadiene and

- R.D. Chambers, A.A. Lindley, and H.C. Fielding,  
JCS, Perkin I, 1981, 939.
151. Reactions Involving Fluoride Ion. Part 23. Thermolytic Dehalogenation of Perfluoroalkenes in the  
Synthesis of Fluorinated Dienes and Cyclobutenes  
R.D. Chambers, A.A. Lindley, H.C. Fielding, J.S. Maitell, and G. Whittaker  
JCS, Perkin I, 1981, 1064.
155. Reactions Involving Fluoride Ion. Part 21. Syntheses from Perfluorocyclobutene  
R.D. Chambers, C.G.P. Jones, G. Taylor, and R.L. Powell  
J. Fluorine Chem., 1981, 19, 407.
156. Anionic Co-Oligomerisations with Hexafluorobut-2-yne  
R.D. Chambers and C.G.P. Jones  
J. Fluorine Chem., 1981, 17, 561.
157. Photochemistry of Halocarbon Compounds. Part 4. Photochemical Conversions of Some Fluorinated  
Aza- and Diaza-cyclohexadienes  
R.N. Barnes, R.D. Chambers, R.D. Hercliffe, and R. Middleton  
JCS, Perkin I, 1981, 3289.
- 1982
158. 'Fluorinated Heterocyclic Compounds'  
R.D. Chambers  
Dyes and Pigments, 1982, 3, 183-190.
159. Reactions Involving Fluoride Ion. Part 25. A Fluoride-ion-Induced Skeletal Rearrangement  
R.D. Chambers, J.R. Kirk, G. Taylor, and R.L. Powell  
JCS, Perkin I, 1982, 673.
160. Reactions Involving Fluoride Ion. Part 26. Nitranions from Perfluoroazacyclohex-ene and -diene  
Derivatives  
R.N. Barnes, R.D. Chambers, and R.S. Matthews  
J. Fluorine Chem., 1982, 20, 307.
161. A Novel Cyclisation Process Involving Fluorine Displacement  
R.D. Chambers, M.J. Silvester, M. Tamura, and D.E. Wood  
JCS, Chem. Comm., 1982, 1412.
162. Mechanisms for Reactions of Halogenated Compounds. Part 4. Activating Influences of  
Ring-Nitrogen and Trifluoromethyl in Nucleophilic Aromatic Substitution  
R.D. Chambers, P.A. Martin, J.S. Waterhouse, and D.L.H. Williams  
J. Fluorine Chem., 1982, 20, 507.
- 1983
163. A Novel Rearrangement of a Strained Pyrazoline